

REMARKS

Applicants acknowledge receipt of the Office action dated August 25, 2005, in which the Examiner: 1) rejected claims 1 and 11 as allegedly anticipated by Zoltan (U.S. Pat. No. 5,049,822); 2) rejected claims 30, 32, 34 and 36 as allegedly anticipated by Ritter (U.S. Pat. Pub. No. 20050001624); 3) rejected claims 2-9 and 12-29 as obvious over Zoltan in view of allegedly admitted prior art; 4) rejected claim 31 as allegedly obvious over Ritter in view of Fabris (U.S. Pat. No. 6,801,039); 5) rejected claim 35 as allegedly obvious over Ritter in view of Zoltan; and 6) objected to claims 10 and 33 as being dependent upon a rejected base claim, but otherwise allowable.

With this Response, Applicant amend claims 1-4, 7, 9, 12, 14-16, 18, 20, 23, 25-26, 28, 30 and 33-35, and cancel claims 6, 10 and 22.

I. EFFECTIVELY ALLOWED CLAIMS

The Office action dated August 25, 2005 objected to claims 10 and 33 as dependent upon rejected base claims, by otherwise allowable. In response, Applicants re-write claim 7 into independent form, including the limitations of its base claim (claim 1) and also incorporating the limitations of claim 10, now cancelled (which the Examiner indicated was allowable). Applicants further amend claim 7 to remove the “minimized” terminology, to remove limitations not needed to define over the cited art, and to ensure an interpretation that the magnitude of the first current, the second current, or both could adjust to reduce the voltage, none of which are narrowing amendments. Finally, Applicants amend claim 9 to ensure that the voltage as between the two electrodes need not be exactly zero to infringe. Claims 7-9 should be in a condition for allowance.

Applicants leave claim 33 in its dependent form.

II. CLAIM REJECTIONS

A. Claim 1

Claim 1 stands rejected as allegedly anticipated by Zoltan. Applicants amend claim 1 to place the claim in better form, and to more clearly define over the system of Zoltan where none of the electrodes are used for current return.

Zoltan is directed to a method of and apparatus for carrying out measurements on open and closed fractures in a hard rock formation pierced by a borehole. (Zoltan Title). In particular, Zoltan discusses a wireline device having a plurality of pads that contact a borehole wall.

(Zoltan Figure 1; Col. 9, lines 41-42). Contacting the borehole wall is apparently an important aspect of Zoltan, as Zoltan states in several locations that there cannot be contact between Zoltan's electrodes and the drilling fluid.

[T]he drilling mud 2 cannot come into contact with the system of electrodes contacted with the wall region 8 of the borehole.

(Zoltan Col. 10, lines 4-6).

The curved surface of the measuring pad 6 is pressed against the investigated wall region 8 in the hard rock formation 8 [sic] in a way that there is no electric contact between the electrode system of the measuring pad 6 and the drilling mud 2.

(Zoltan Col. 10, lines 63-68). Moreover, as Applicants read Zoltan, none of Zoltan's electrodes are used as current returns. Referring specifically to Zoltan's Figure 2, the current return for the main current generator 15 and the controlled current generator 16 is the "far return feeding electrode 24." (Zoltan Figure 2; Col. 10, lines 16-19; lines 26-29). The same is true for the systems of Zoltan's Figures 4 and 7.

Claim 1, by contrast, specifically recites, "a set of concentric electrodes, said set comprising a first electrode, a second electrode outside the first electrode, a third electrode outside the second electrode, a fourth electrode outside the third electrode, a fifth electrode outside the fourth electrode, and a sixth electrode outside the fifth electrode; **wherein the first electrode emits a first current, and wherein a return for the first current is at least one of the fifth electrode or the sixth electrode.**" Applicants respectfully submit that Zoltan does not teach, suggest or even imply such a system. Zoltan clearly teaches that the current return for the two current generators of Zoltan to be a "far return feeding electrode 24." The remaining electrodes of Zoltan appear to be for voltage measurements. Applicants respectfully submit that Zoltan thus does not teach "the first [concentric] electrode emits a first current, and wherein a return for the first current is at least one of the fifth [concentric] electrode or the sixth [concentric] electrode." The advantage of such a system is the ability to measure resistivities of interest in systems having standoff from the borehole wall (like MWD/LWD systems), and even calculating standoff distance.

Based on the foregoing, Applicants respectfully submit that claim 1, and all claims which depend from claim 1 (claims 2-5 and 11), should be in a condition for allowance. Applicants amend claims 2-4 to reflect the amendments to claim 1. Further, Applicants amend claim 4 to remove the

“minimized” terminology, and to ensure an interpretation that either the magnitude of the first current, the second current, or both could adjust to reduce the voltage. Neither of these amendments is a narrowing amendment.

B. Claim 12

Claim 12 stands rejected as obvious over Zoltan in view of allegedly admitted prior art. Applicants amend claim 12 by rewriting the claim into independent form, and in better form. Claim 12 already contained these limitations by virtue of its previous dependency. Moreover, Applicants amend claim 12 to remove the “minimized” terminology, and to ensure an interpretation that either the magnitude of the first current, the second current, the third current, or any combination thereof, could adjust to reduce the voltage. Neither of these amendments is a narrowing amendment.

Zoltan is directed to a method of and apparatus for carrying out measurements on open and closed fractures in a hard rock formation pierced by a borehole. (Zoltan Title). In particular, Zoltan discusses a wireline device having a plurality of pads that contact a borehole wall. (Zoltan Figure 1; Col. 9, lines 41-42). Contacting the borehole wall is apparently an important aspect of Zoltan, as Zoltan states in several locations that there cannot be contact between Zoltan’s electrodes and the drilling fluid. (Zoltan Col. 10, lines 4-6; lines 63-68).

With respect to the allegedly admitted prior art, Applicant respectfully traverse the assertion that they have admitted “that the **only** difference between the present invention and the prior art is the addition of one electrode.” (Office action dated August 25, 2005, Page 4 (emphasis added)). The cited location points out a feature and/or advantage that four depths of investigation of the various embodiments can be accomplished with one extra electrode, but does **not** teach or imply that the one electrode is the **only** difference.

However, it should also be understood that the design of Figure 2 is advantageous in providing a tool capable of four depths of investigation but that includes only one more concentric electrode than the known one-mode tool design of shown in Figure 1A.

(Specification paragraph [0022]).

The Office action dated August 25, 2005 admits as a matter of law that Zoltan alone does not teach or fairly suggest the limitations of claim 12. Because the Applicant’s statements are

not as the Office action dated August 25, 2005 asserts, the Office action fails to make a *prima facie* case of obviousness with respect to claim 12. For this reason alone claim 12 should be allowed.

Moreover, claim 12 specifically recites, “wherein said first electrode emits a first current, said fourth electrode emits a second current, and at least one of said fifth or sixth electrodes emits a third current, said seventh electrode being a current return for said first, second and third currents, at least one of said first, second, or third currents adjust to reduce a voltage between said second and third electrodes.” Applicants respectfully submit that Zoltan and the allegedly admitted prior art fail to teach or suggest the limitations of claim 12. Zoltan, considered with or without an allegedly admitted prior art, fails to teach or suggest “wherein said first electrode emits a first current, said fourth electrode emits a second current, and at least one of said fifth or sixth electrodes emits a third current.”

Based on the foregoing, Applicants respectfully submit that claim 12, and all claims which depend from claim 12 (claims 13 and 14), should be allowed. Applicants amend claim 14 to make clear that the voltage between the second and third electrodes need not necessarily be exactly zero, and to remove extraneous words, neither of which is a narrowing amendment.

C. Claim 15

Claim 15 stands rejected as obvious over Zoltan in view of allegedly admitted prior art. Applicants amend claim 15 to remove the “including” terminology, which is not to define over any cited art, and is not a narrowing amendment.

Claim 15 clearly states, “a set of electrodes on said tool body, said set of electrodes comprising a first electrode, a second electrode, a third electrode, a fourth electrode, a fifth electrode, and a sixth electrode **arranged linearly with respect to said length**; wherein said first electrode is a current source.” Applicants respectfully submit that Zoltan and the allegedly admitted prior art fail to teach or suggest the limitations of claim 15. In particular, Zoltan and the allegedly admitted prior fail to teach, suggest or even imply that there should be six electrodes “arranged linearly with respect to said length,” as, for example, illustrated in Applicants Figure 2A.

Based on the Foregoing, Applicants respectfully submit that claim 15, and all claims which depend from claim 15 (claims 16-21 and 23-29) should be allowed. Claim 16 is amended to remove the “short circuit” terminology. Claims 23 is amended to remove the “minimizing”

terminology, and to ensure an interpretation that either the magnitude of the first current, the second current, or both could adjust to reduce the voltage. Claim 26 is amended to remove the “minimized” terminology, and to ensure an interpretation that either the magnitude of the first current, the second current, the third current, or any combination thereof, could adjust to reduce the voltage. Claim 28 is amended to make clear that the voltage between the second and third electrodes need not necessarily be exactly zero, and to remove extraneous wording. None of these amendments is a narrowing amendment.

D. Claims 18 and 20

Claims 18 and 20 stand rejected as obvious over Zoltan in view of allegedly admitted prior art. Applicants amend claims 18 and 20 to ensure an interpretation that either the fifth electrode, the sixth electrode, or both could be the return for various currents, which is not a narrowing amendment. Moreover with respect to claim 20, Applicants amend to remove the “minimizing” terminology, and to ensure an interpretation that either the magnitude of the first current, the second current, or both could adjust to reduce the voltage. Neither of these amendments is a narrowing amendment.

Claims 18 and 20 specifically state, “at least one of said fifth or sixth electrodes being a current return....” Applicants respectfully submit that Zoltan in view of the allegedly admitted prior art does not teach, suggest or even imply such a system. Zoltan clearly teaches that the current return for the two current generators of Zoltan to be a “far return feeding electrode 24.” The remaining electrodes of Zoltan appear to be for voltage measurements. Applicants respectfully submit that Zoltan thus does not teach “at least one of said fifth or sixth electrodes being a current return....”

Claims 18 and 20 are allowable for at least the same reasons as claim 15, from which they depend, as well for the additional limitations therein.

E. Claim 30

Claim 30 stands rejected as allegedly anticipated by Ritter. Applicants amend claim 30 to ensure a reading that does not specifically require use of all four measurements if the parameter of interest could be calculated with less than four measurements.

Ritter is directed to resistivity images of a borehole wall during rotational drilling. (Ritter Title; Abstract). In particular, and with reference to Ritter’s Figures 4, Ritter appears to disclose a

system having only a single depth of investigation as there is only one guard electrode 153, and with current returning to the tool body 157. (Ritter paragraph [0042]). With reference to Ritter's Figure 5, Ritter discloses a system having two depths of investigation, a shallow depth and a deeper depth, based on different configurations of the electrodes 203 and 209. (*Id.*) Thus, Ritter expressly discloses two depths of investigation, and does not inherently contain a teaching of any more than two depths of investigation.

Claim 30, by contrast, specifically recites, "measuring a first resistivity at a first distance from said resistivity measurement device; measuring a second resistivity at a second distance from said resistivity measurement device; measuring a third resistivity at a third distance from said resistivity measurement device; measuring a fourth resistivity at a fourth distance from said resistivity measurement device; calculating said flushed zone resistivity from one or more of said measured first resistivity, said second resistivity, said third resistivity, or said fourth resistivity, said flushed zone being a region of formation invaded by drilling fluid." Applicants respectfully submit that Ritter does not teach or fairly suggest the limitations of claim 30. The Office action dated August 25, 2005 attempts to rely on Ritter's paragraph [0043] for a teaching of up to six depths of investigation; however, the paragraph cited, and Ritter in general, fails to expressly teach more than two depths of investigation, and further does not inherently contain a teaching of more than two depths of investigation for galvanic tools. The cited paragraph is reproduced immediately below for convenience of the discussion:

[0043] One possible arrangement is of the commonly used device known as the laterolog Current is sent between different guard electrodes to achieve different depths of investigation into the formation. In the configuration referred to as a microlaterolog, guard electrode surrounds said measure electrode and maintains a focusing of said measure current in a flushed zone of said formation. The electrodes may be configured to create substantially spherical equipotential surfaces. This is referred to as spherical focusing. In the "short normal" configuration, a current electrode conveys a measure current into said formation, and voltage is measured at a measure electrode spaced apart from said current electrode From the voltage of the measure electrode and the measure current, an indication of a resistivity of said earth formation is obtained. In a particular embodiment of the present invention, the guard electrode may extend the full circumference of the tool. All of these are known in the art and are not discussed further

(Ritter paragraph [0043]). At best, the cited location supports only two depths of investigation, one

to the flushed zone, and one “short normal” that conveys current sufficiently far into the formation to read the formation resistivity beyond the flushed zone (non-invaded formation resistivity). There is no express teaching beyond those two, and having more than two depths is not inherently present. This reading of Ritter is buttressed by the fact Applicants discuss the laterolog tool in their specification as well, and note only a “Laterolog Shallow (LLS)” mode and a “Laterolog Deep (LLD)” mode. (Specification paragraph [0033]).

Based on the foregoing, Applicants respectfully submit that claim 30, and all claims which depend from claim 30 (claims 31-36), should be allowed. Applicants amend claims 33 and 35 to remove the “including” terminology. Further, Applicants amend claim 34 to ensure that the claim does not fall within 35 USC 112, paragraph 6. None of these amendments is a narrowing amendment.

III. CLAIM CANCELLATIONS

With this Response, Applicants cancel claims 6, 10 and 22 without prejudice to later asserting the claims, such as in a continuation application.

IV. CONCLUSION

In the course of the foregoing discussions, Applicants may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the cited art which have yet to be raised, but which may be raised in the future.

Appl. No. 10/743,508

Amdt. Dated : November 9, 2005

Amendment & Response to Office Action of August 25, 2005

Applicants respectfully request reconsideration and that a timely Notice of Allowance be issued in this case. It is believed that no extensions of time or fees are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required (including fees for net addition of claims) are hereby authorized to be charged to Conley Rose, PC's Deposit Account No. 03-2769.

Respectfully submitted,

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